

### **Remarks**

The application has been reviewed in light of the Office Action dated September 9, 2005. By the foregoing amendments, non-elected claim 6 is cancelled without prejudice. Claims 1-5 are currently pending in this application. Reconsideration of the Office Action is earnestly requested in view of the following remarks.

The Examiner has provisionally rejected claims 1-5 under the judicially created doctrine of obviousness-type double patenting over claims 1, 2 and 6-16 of copending Application No. 10/298,412. Applicants respectfully disagree and ask the Examiner to reconsider this rejection.

The present invention as claimed is directed to a method for the production of a work piece by the successive compacting and by subsequent mechanical finishing. As particularly recited in independent claim 1, claims 1-5 each require, among other elements, that the mechanical finishing of a vertical side wall of an  $n$ th layer is performed after the generation of an  $n + x^{\text{th}}$  layer only.

The referenced invention of Application No. 10/298,412 (which was invented by the same applicants as this invention and has also been assigned to the same assignee of the present invention) is directed to the production of a work piece by the mechanical finishing of substantially vertical lateral faces of the work piece. Applicants respectfully submit that the '412 Application fails to disclose or teach at least the above-identified element of the present invention. Because the '412 Application does not include any disclosure or teaching that the mechanical finishing of the side wall of  $n$ th layer is performed after the generation of an  $n + x^{\text{th}}$  layer only, a person skilled in the art would not wait with the mechanical finishing of the vertical sidewalls until several layers are completed but would rather start immediately after having finished each layer

as taught by prior art. This distinctive feature of the present invention provides a significant difference over the prior art method and cannot easily be contemplated by a person of skill in the art with the knowledge of the '412 Application or other known prior art.

There are several disadvantages coming along with finishing vertical sidewalls one after another. The main disadvantage is that terraces or burrs will be built on the sidewalls due to the layer by layer performance. This leads to surfaces on the work piece that are not smooth and hence will cause aesthetical disadvantages when creating injection molds, which is the main target of this technology. Contrary to this, the main effect in the present invention is to wait with a mechanical finishing of vertical sidewalls until several layers will be generated so that the mechanical finishing of the vertical sidewalls avoids formation of terraces. Another advantage of the present invention over the prior art is the compensation of thermal changes of the work piece which goes along with precision and accuracy of the work piece dimensions. If we wait with the mechanical finishing until the layer is cooled off, no distortion will effect the dimensions of the work piece. As such, the deferred mechanical finishing method of the present invention provides a superior finishing over the immediate finishing method of prior art.

Accordingly, in view of the foregoing, Applicants respectfully submit that the invention as claimed in claims 1-5 is patentably distinct over claims 1, 2 and 6-16 of copending Application No. 10/298,412 of Applicants.

The Examiner has rejected claims 1-5 under 35 U.S.C. 103(a) as being unpatentable over Benda (US Pat. No. 5,472,733) in view of Prinz (US Pat. No. 5,207,371).

As particularly recited in independent claim 1, claims 1-5 of the invention require, among other elements, (i) that at least one of the two vertical side walls is subject to mechanical finishing subsequent to the compacting of said powdered starting material that has been applied horizontally in layers, (ii) that the work piece to be formed is surrounded by powdered starting material during its production, and (iii) that the mechanical finishing of a vertical side wall of an  $n$ th layer is performed after the generation of an  $n + x^{\text{th}}$  layer only.

Benda (US Pat. No. 5,472,733) discloses a system and method for performing a temperature-controlled laser sintering. Benda, however, fails to disclose or teach at least the above-identified elements (i), (ii), and (iii) of the claimed invention. In fact, there is no mechanical finishing mentioned or described at all in Benda.

Prinz (US Pat. No. 5,207,371), on the other hand, discloses an apparatus and method for forming a three-dimensional object, with successive layers of metal welded together to build the object. Prinz further discloses a mechanical finishing process performed by milling of the welded layers to a final shape. However, Prinz fails to disclose or teach at least the above-identified elements (ii) and (iii) of the claimed invention.

In particular, the mechanical finishing aspect suggested in Prinz is applied only on the last manufactured layer, but not on several layers as particularly required by the above element (iii) which is one of the main features of the present invention. See Figs. 1-7 and accompanied disclosure of Prinz.

Moreover, it is clear that the mechanical finishing process of Prinz is not to be performed on the work piece while it is surrounded by powdered starting material as required by the above element (ii) of the invention. This is another important feature of the present invention, and Prinz does not disclose or anticipate this aspect of the

invention. It is very unique for this invention that the mechanical finishing is performed with the work piece surrounded by powdered starting material. Hence, according to the method of the invention, the tool dips into the powdered starting material while performing the milling on the work piece which is surrounded by the powder material. Because the milling tools are very small, typically having a diameter of about 0.5 mm, the dipping is not causing any disturbances in the powdered starting material. As such, the present invention can provide a finishing process more efficient and productive than the prior art method for finishing the multiple layers of the work piece.

Accordingly, because Benda and Prinz, either alone or in combination with one another, fail to disclose or teach at least the above-identified elements (ii) and (iii) of the invention as claimed, claim 1-5 are patentably distinct over these references.


Applicants respectfully further submit that it would not have been obvious to modify the cited references, either alone or when combined, to arrive at the present invention as claimed. It is well settled that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the modification or combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). In the present case, it is clear that the references of record fail to disclose or suggest the above identified elements of the invention as claimed. Applicants respectfully submit that there is absolutely no motivation provided in either of the references to make the modifications necessary to arrive at the claimed invention.

For the foregoing reasons, Applicants respectfully submit that all pending claims, namely claims 1-5, are patentable over the references of record, and earnestly solicits allowance of the same.

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Respectfully submitted,

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